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717/$$$.ccls. AND hot.ti.	3

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Search History

DATE: Tuesday, February 24, 2004 Printable Copy Create Case

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DB=USPT; PLUR=NO; OP=OR			
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L3	L1 and threshold.ti.	0	L3
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☐ 1. Document ID: US 6681387 B1

L5: Entry 1 of 3 File: USPT Jan 20, 2004

US-PAT-NO: 6681387
DOCUMENT-IDENTIFIER: US 6681387 B1

TITLE: Method and apparatus for instruction execution hot spot detection and monitoring in a data processing unit

DATE-ISSUED: January 20, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hwu; Wen-mei William	Champaign	IL		
Merten; Matthew Carl	Champaign	IL		
Trick; Andrew Raymond	Champaign	IL		
George; Christopher Neith	Urbana	IL		
Gyllenhaal; John Christopher	Livermore	CA		

US-CL-CURRENT: 717/158; 711/1, 712/234, 714/38, 717/127, 717/131

ABSTRACT:

Disclosed is a method and apparatus for detecting and monitoring program hot spots during execution that may be implemented in hardware. A hot spot detector tracks branch instructions which are retired. Frequently executed branch instruction addresses within a particular interval are designated as hot spot candidates. A hot spot detection counter is used to track non-hot spot branches and hot spot candidate branches. When hot spot candidate branches are frequently encountered compared to non-hot spot candidate branches, the hot spot detector may notify the operating system and hot spot candidate branch addresses may be supplied to a runtime optimizing compiler and a monitor table or a hot spot monitor. The hot spot monitor may disable the hot spot detector when a program is operating in known hot spots and may enable the hot spot detector if the program has strayed from known hot spots.

59 Claims, 5 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 5

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. D

☐ 2. Document ID: US 6470492 B2

L5: Entry 2 of 3 File: USPT Oct 22, 2002

US-PAT-NO: 6470492
DOCUMENT-IDENTIFIER: US 6470492 B2

TITLE: Low overhead speculative selection of hot traces in a caching dynamic translator

DATE-ISSUED: October 22, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bala; Vasanth	Sudbury	MA		
Duesterwald; Evelyn	Boston	MA		

US-CL-CURRENT: 717/128

ABSTRACT:

A method and apparatus for selecting hot traces for translation and/or optimization is described in the context of a caching dynamic translator. The code cache stores hot traces. Profiling is done at locations that satisfy a start-of-trace condition, e.g., the targets of backward taken branches. A hot target of a backward taken branch is speculatively identified as the beginning of a hot trace, without the need to profile the blocks that make up the trace. The extent of the speculatively selected hot trace is determined by an end-of-trace condition, such as a backward taken branch or a number of interpreted or native instructions. The interpreter is augmented with a mode in which it emits native instructions that are cached. A trace is cached by identifying a hot start of a trace and then continuing interpretation while storing the emitted native instruction stream until an end-of-trace condition is met.

13 Claims, 3 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 3

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

☑ 3. Document ID: US 6189141 B1

L5: Entry 3 of 3 File: USPT Feb 13, 2001

US-PAT-NO: 6189141
DOCUMENT-IDENTIFIER: US 6189141 B1

TITLE: Control path evaluating trace designator with dynamically adjustable thresholds for activation of tracing for high (hot) activity and low (cold) activity of flow control

DATE-ISSUED: February 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Benitez; Manuel E.	Cupertino	CA		
Mattson, Jr.; James S.	Campbell	CA		
Buzbee; William B.	Half Moon Bay	CA		
Shah; Lacky V.	Sunnyvale	CA		

US-CL-CURRENT: 717/153; 717/156, 717/158

ABSTRACT:

A computer-implemented system, method, and product are provided to designate and translate traces of original instructions of an executable file at run time based on dynamic evaluation of control flow through frequently executed traces of instructions. Such designation typically reduces unnecessary translations and optimizations, and thereby increases execution speed and reduces the usage of memory and other resources. The invention includes a hot trace identifier to identify frequently executed traces of instructions and a hot trace instrumenter to instrument such frequently executed traces so that control flow through them may be recorded. If the amount or rate of control flow through a frequently executed trace exceeds a threshold value, a hot trace selector is invoked to select a hot trace of original instructions including those of the frequently executed trace. The hot trace may be dynamically optimized. The system, method, and product also provide for the continuous recording of control flow through hot traces. If control flow has changed during execution, such that the amount or rate of control flow through a hot trace falls below a threshold value, the trace may be removed.

69 Claims, 15 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 13

Terms	Documents
717/$$$.ccls. AND hot.ti.	3

Refine Search

Search Results -

Terms	Documents
L3 AND flow	35

Database:
- US Pre-Grant Publication Full-Text Database
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Search: L4

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Search History

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	DB=USPT; PLUR=NO; OP=OR		
L4	L3 AND flow	35	L4
L3	L2 AND display	39	L3
L2	L1 and monitor	40	L2
L1	(5720018 6473638 5903730 6059842 5953730 5761063 5740429 5982373 6041333 6128629 6476304 RE34559 5375199 6163740 5446838 5576946 6289299 5664190 6036345 6141699 6178460 5432932 5483468 5506955 5553235 5684945 5836529 5949976 6070190 6199199 6321263 6330008 6467052 6553419 6601016 5537145 5949426 6396500 6456305 5738527 5980264 5987149 6003145 6112194 6256399 6314470 6324126 6324490 6333948 6466683).pn.	50	L1

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